

REMARKS

Examiner J. Maldonado is thanked for the thorough examination and search of the subject Patent Application.

All Claims are believed to be in condition for Allowance, and that is so requested.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 1-3 and 6 as being unpatentable over Rhodes et al, Ye et al, Huang et al, and Liu et al is requested in accordance with the following remarks.

Applicant agrees that the cited art teach methods to form interconnects. However, Applicant does not believe that the cited art, individually or in combination, teach, suggest or hint at the method of Applicant's claimed invention. In particular, Applicant teaches forming self-aligned, anti-via interconnects using a method wherein a tantalum-containing etch stop layer 62 is used as an etching stop between the first metal layer 58 and the second method layer 66. More particularly, this tantalum-containing etch stop layer 62 specifically prevents etching of the first metal layer 58 during the etching of the second overlying metal layer 66 to form vias.

The Examiner states on page 10 of the most recent office action that Ye et al "was cited to prove that tantalum containing layers could be used as etch stopping layers when etching a metal layer comprising copper or aluminum." However, Ye et al does not teach or suggest

employing a tantalum-containing layer as an etch stop for a metal etching process. Ye et al shows only one metal layer 216 (or 316). There is no instance in Ye et al where an overlying metal layer is etched and an underlying metal layer is not etched, but is protected from etching by an etch stop layer. The etch stop layer 218 is used to protect the copper layer 216 from oxidation (col. 12, lines 40-43), but it is never used to protect the copper layer 216 from etching where an overlying metal layer is etched. Thus, since the etch stop layer of Ye et al is not used to prevent etching of an underlying metal layer during metal etching, Applicant cannot agree with the Examiner's position that one skilled in the art would have thought to combine Ye et al with Rhodes et al.

Applicant has reviewed Naik et al and has found that that while an etch stop layer is formed on top of dielectric layer 410, the etch stop layer 416 underlies the metal layer 422 within a via. Metal layer 418 and 422 are the same layer. The etch stop layer prevents etching of the underlying dielectric layer 410 during metal etching and incidentally prevents some etching of the metal 422 when the metal 418 is mis-aligned. Thus, while Naik et al is of general interest to the patent application, it is agreed with the Examiner that Naik et al does not apply to the detailed claims of the present invention.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 1-3 and 6 as being unpatentable over Rhodes et al, Ye et al, Huang et al, and Liu et al is requested in view of Amended Claims 14, 16, 19, and 21 and in accordance with the remarks above.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 9-12, 15, and 18-21 as being unpatentable over Rhodes et al, Ye et al, Huang et al, Liu et al, and Pangrle et al is requested in view of Amended Claims 14, 16, 19, and 21 and in accordance with the following remarks.

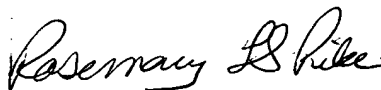
As discussed above, the references, individually or in combination, do not teach or suggest a tantalum-containing etch stop layer to prevent etching of a first metal layer during the etching of a second overlying metal layer.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 9-12, 15, and 18-21 as being unpatentable over Rhodes et al, Ye et al, Huang et al, Liu et al, and Pangrle et al is requested in accordance with the remarks above.

Allowance of all Claims is requested.

It is requested that should Examiner Maldonado not find that the Claims are now Allowable that the Examiner call the undersigned at 765 4530866 to overcome any problems preventing allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rosemary L. S. Pike". The signature is written in a cursive, flowing style.

Rosemary L. S. Pike. Reg # 39,332